GUIDE TO THE 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE

RESIDENTIAL

CALGreen®

HOUSING AND COMMUNITY DEVELOPMENT • CALIFORNIA •

ICC INTERNATIONAL CODE COUNCIL®

Guide to the 2019 California Green Building Standards Code (Residential)

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Table of Contents

ABBREVIATIONS AND ACRONYMS

(This list is provided for user convenience. Terms defined or explained further in *CALGreen* and in this guide are not included in this list.)

AB	Assembly Bill (legislation) followed by a number; approved bills often followed by a Chapter (Ch.) number and year of statutes (Stat.)
ACCA	Air Conditioning Contractors of America
ACM	Alternative Calculation Method as used by the California Energy Commission
ANSI	American National Standards Institute
ARB/CARB	California Air Resources Board
ASME	American Society of Mechanical Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASTM	American Society for Testing and Materials
BSC-CG-CBSC	California Building Standards Commission, *CALGreen*
California Climate Zones	Shown on California Energy Commission Climate Zone Map
CALGreen	*California Green Building Standards Code*
Cal/EPA	California Environmental Protection Agency
CalRecycle	California Department of Resources Recycling and Recovery (formerly California Integrated Waste Management Board and Department of Conservation)
CBC	*California Building Code* (CCR, Title 24, Part 2)
CCR	*California Code of Regulations* (includes Title 24, the *California Building Standards Code*)
C & D	Construction and demolition as used for construction waste
CEC*	California Energy Resources Conservation and Development Commission (aka California Energy Commission); ***Also refers to** *California Energy Code* (CCR, Title 24, Part 6)
CRC	*California Residential Code* (CCR, Title 24, Part 2.5)
CWMP	Construction Waste Management Plan
DWR	Department of Water Resources

ABBREVIATIONS AND ACRONYMS (continued)

(This list is provided for user convenience. Terms defined or explained further in *CALGreen* and in this guide are not included in this list.)

EPA	U.S. Environmental Protection Agency
GPM/gpm	Gallons per minute related to liquid flow
HCD	California Department of Housing and Community Development
HERS	Home Energy Rating System Program (administered by the California Energy Commission)
HR or [HR]	HCD "banner" designating provisions applicable for high-rise residential buildings.
HVAC	Heating, ventilating and air conditioning
MWELO	Model Water Efficient Landscape Ordinance, located in the *California Code of Regulations*, Title 23, Division 2, Chapter 2.7.
NSF	NSF International (formerly National Sanitation Foundation)
PSI/psi	Pounds per square inch as related to pressure
SB	Senate Bill (legislation) followed by a number; approved bills often followed by a Chapter (Ch.) number and year of statutes (Stat.)
SCAQMD	South Coast Air Quality Management District
SWRCB	State Water Resources Control Board
TITLE 17	Public Health regulations in the *California Code of Regulations* (CCR)
TITLE 20	Public Utilities and Energy regulations in the *California Code of Regulations* (CCR)
TITLE 23	The Department of Water Resources (DWR) regulations in the *California Code of Regulations* (CCR), located in Division 2.
TITLE 24	*California Building Standards Code,* as included in the *California Code of Regulations* (CCR)
VOC	Volatile organic compounds as defined in *CALGreen*, Chapter 2

CONTACT AND PURCHASING INFORMATION

California Green Building Standards for Residential Buildings

California Department of Housing and Community Development
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State Housing Law Program
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Sacramento, CA 95826-2582
Telephone: (800) 952-8356
Fax: (916) 854-2551
Website: www.hcd.ca.gov
Questions: See "Questions, Comments, Feedback" on website. Use "Leave Us a Comment" form.

California Residential Energy Efficiency Standards

California Energy Efficiency Hotline
Telephone: (916) 654-5106; 1-800-772-3300 (toll free in CA)
E-mail: title24@energy.state.ca.us

California Green Building Standards for Nonresidential Buildings

California Building Standards Commission
2525 Natomas Park Drive, Suite 130
Sacramento, CA 95833
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Fax: (916) 263-0959
Website: www.dgs.ca.gov/bsc
E-mail: cbsc@dgs.ca.gov

Purchasing Information for "Guide to the 2019 California Green Building Standards Code – Residential" and the 2019 *CALGreen* (loose-leaf or eCode)

International Code Council
3060 Saturn Street, Suite 100
Brea, CA 92821
Telephone: 1-888-ICC-SAFE (422-7233)
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Fax: 1-866-891-1695
Website: www.iccsafe.org
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Preface

The Division of Codes and Standards in the Department of Housing and Community Development (HCD) is pleased to provide the following document, Guide to the 2019 California Green Building Standards Code – Residential. This guide includes selected text from the 2019 California Green Building Standards Code, known as CALGreen, which was developed from review and adoption of "carryover" 2016 CALGreen provisions as well as new provisions and modifications based on feedback and input from numerous stakeholders. The 2019 CALGreen Guide also addresses changes to the 2016 CALGreen from the 2016 Intervening Code Adoption Cycle. The 2019 CALGreen becomes effective on January 1, 2020.

This guide was developed by HCD to supplement our core publication, *A Guide to California Housing Construction Codes*. The 2019 *CALGreen* Guide provides commentary, background, questions and answers and some helpful tools for the code user to better understand the mandatory and voluntary measures developed by HCD for residential structures. It is intended to provide additional guidance and further enhance user awareness and understanding. Increased awareness of state laws, regulations, and building standards will improve compliance and reduce housing construction costs and delays.

HCD encourages homeowners, design and industry professionals and building department personnel involved in the construction, maintenance, and use of residential buildings to read this guide as a complement to the mandatory measures and enhanced voluntary tiers in the 2019 *CALGreen*. Further, users of the 2019 *Guide to the California Green Building Standards Code – Residential* should always utilize the most current version of *CALGreen*, including amendments from the Intervening Code Adoption Cycle, emergency regulations, other supplements or ERRATA that are published for that specific edition of the code. Users should also check for any local amendments applicable to structures for specific jurisdictions.

Note: Readers new to California laws, regulations, building standards development or HCD's role may find it beneficial to read *A Guide to California Housing Construction Codes,* available at http://www.hcd.ca.gov/.

Acknowledgements

HCD appreciates and acknowledges the time, effort and technical expertise so many participants provided during the initial development and subsequent versions of *CALGreen*. Participants were comprised of other state agencies, model code organizations, building officials, the construction industry, the environmental community and green building industry.

HCD expresses special thanks to the California Building Industry Association, which provided additional assistance, time and resources to facilitate timely completion of the first edition in June 2010.

Introduction to *CALGreen*

CALGreen is California's first green building code and a first-in-the-nation state-mandated green building code. It is formally known as the *California Green Building Standards Code*, Title 24, Part 11, of the *California Code of Regulations*.

This guide will provide helpful tools and information about *CALGreen*'s mandatory measures, voluntary tiers, and other regulations, laws and construction codes related to green building standards, which are applicable to residential construction in California. It is recommended that the reader be familiar with California building standards development, adoption and implementation processes as discussed in HCD's *A Guide to California Housing Construction Codes*, which provides general information on California building codes. It is also recommended that the reader have the current edition of *CALGreen* for reference while reading this guide.

It is important that code users reference the appropriate version of *CALGreen*, including any errata or supplements from emergency or intervening code adoption cycles. Additionally, code users should be aware of lawfully enacted local amendments such as ordinances or resolutions requiring additional and/or more restrictive green building standards.

The complete *CALGreen* may be viewed on HCD's website at www.hcd.ca.gov or on the California Building Standards Commission's website at www.dgs.ca.gov/bsc. It is also available for purchase from the International Code Council (www.iccsafe.org).

Background

Development of California green building standards was originally approached from a legislative or statutory approach. Several Assembly Bills (AB 35, AB 888, and AB 1058) were introduced during the 2007–2008 legislative session to require green building standards for state-owned or leased buildings, commercial buildings, and residential buildings, respectively. Although the broad intent for implementing green building measures was supported by the Governor's Office, after much consideration, these bills were ultimately vetoed. Governor Arnold Schwarzenegger's veto message stated:

- Building standards should not be statutory. The California Building Standards Commission (BSC) was created to ensure an open public adoption process allowing experts to develop building standards, including periodic updates to the building codes.
- Allowing private entities to dictate California's building standards usurps the state's authority to develop and adopt those standards and could compromise the health and safety of Californians.
- State agencies were encouraged to review all nationally recognized programs and glean from those programs, standards that promote greener construction, energy and water conservation, and reduce greenhouse gas emissions.
- The need to expedite the greening of California's building standards was emphasized and BSC was directed to work with specified state agencies on the adoption of green building standards for residential, commercial, and public building construction for the 2010 code adoption process.

Development of *CALGreen* began in 2007 when the BSC Commissioners directed its staff to develop green building standards for new construction of buildings within its authority and to submit those regulations for adoption during the 2007 Annual Code Adoption Cycle. The Commissioners also requested and encouraged HCD, the Division of the State Architect (DSA), and the Office of Statewide Health Planning and Development (OSHPD) to develop green building standards for new buildings under their areas of authority. Through the rulemaking process, HCD collaborated with BSC, stakeholder groups, other state agencies, considered public input and reviewed existing green building standards, best practices, guidelines and other published references. This initial effort was successful and resulted in BSC's adoption of the 2008 *California Green Building Standards Code*.

Introduction of the 2008 *California Green Building Standards Code* was supplemented by clarifying information that local enforcing agencies have the option to adopt local amendments or even adopt the 2008 *California Green Building Standards Code* prior to its effective date (see BSC Building Standards Bulletin 08-02). It was acknowledged that the initial 2008 *California Green Building Standards Code* would provide a framework and first step toward establishing mandatory green building standards for residential structures and would be enhanced and/or expanded in the future. This vision came to fruition during the Triennial Code Adoption Cycle for the 2010 *California Building Standards Codes*.

As new materials, technology, and designs are developed and become available, and as needs become apparent, *CALGreen* will continue to proactively move California forward to a more sustainable and environmentally responsible future.

2013 California Green Building Standards Code (*CALGreen*)

The 2010 *CALGreen* was evaluated for updates during the 2012 Triennial Code Adoption Cycle. HCD evaluated stakeholder input, changes in technology, implementation of sustainable building goals in California, and changes in statutory requirements. As such, the scope of *CALGreen* was increased to include both low-rise and high-rise residential structures, additions and alterations.

The 2012 Triennial Code Adoption Cycle also involved the California Energy Commission as an active participant and proposing agency in development of green building standards. The BSC adopted and approved HCD's proposed changes and existing 2010 amendments (as brought forward from the 2010 *CALGreen*) during its regular business meeting on December 11, 2012.

During the 2012 Triennial Code Adoption Cycle, HCD also placed "pointers" in various parts of Title 24 to direct code users to *CALGreen*. This was done for several reasons:

1) To familiarize code users with the requirements of *CALGreen*;
2) To refer code users to relevant provisions contained in *CALGreen*; and
3) To locate appropriate sections in other parts of Title 24 for consistency.

2013 *CALGreen* Emergency Regulations

Governor Edmund "Jerry" Brown's Executive Order B-29-15 (April 1, 2015) provided a summary of the ongoing drought conditions in California starting with declarations for a State of Emergency (January 17, 2014) and Continued State of Emergency (April 25, 2014); evidence of a record low snowpack, decreased water levels in reservoirs, reduced river flows, and declining supplies in underground water basins. In addition, the Governor acknowledged that a distinct possibility existed for drought conditions to continue. Further, the Executive Order found that conditions of extreme peril to the safety of persons and property continue to exist due to water shortage and drought conditions with which local authority is unable to cope. To address these concerns, the Executive Order specified that strict compliance with identified statutes and regulations would prevent, hinder, delay or mitigate the effects of the drought. In view of the urgency to conserve California's water resources, as deemed essential by the Governor's Executive Order and prior proclamations, HCD proposed the adoption of these building standards through an emergency adoption process.

The 2015 emergency regulatory action made critically needed changes to the 2013 *CALGreen*, Sections 4.303, 4.304, and A4.304, as related to reduction of indoor and outdoor residential potable water use. These emergengy regulations were approved as permanent regulations in the 2013 *CALGreen*, effective January 26, 2016.

2013 *CALGreen* Intervening Code Adoption Cycle

HCD brought forward the voluntary Electric Vehicle (EV) provisions as new mandatory EV requirements in the 2013 Intervening Code Adoption Cycle. The new mandatory requirements were applicable to one- and two-family and townhouses with attached private garages. HCD also added new requirements for new multifamily projects with 17 or more dwellings.

New one- and two-family dwellings and townhouse with attached private garages were required to have sufficient space and capacity to accommodate a 40-ampere minimum dedicated branch circuit, including overcurrent protective devices, and a raceway. The raceway literally provides a conduit for supporting appropriately sized conductors when EV charging becomes a need for the resident. In addition, the conduit also facilitates easy replacement of any conductors that have been installed if the conductors are damaged or need to be upgraded. A raceway-only installation eliminates concerns for live unused wires or wasted copper wiring. The service panel or subpanel requirements ensure that the panel or subpanel will have sufficient space for the overcurrent protective devices and ampacity to support future EV charging of at least 40-ampere minimum.

New multifamily projects with 17 or more dwelling units were required to provide 3 percent of the total parking spaces as EV spaces. The EV spaces are to be provided in addition to the number of parking spaces required by local parking regulations. Parking space provisions may also be addressed in local zoning ordinances, development agreements or other similar local policies.

It is important to note that the EV requirements did not mandate construction of the electric vehicle charging station (EVCS) or installation of an EV charger. The primary intent was to provide infrastructure to facilitate EV charging as a service to multifamily dwellings. Multifamily dwellings accommodate 34 percent of Californians and are faced with unique criteria related to EV charging including parking access, electrical service access, installation and operation costs and agreements between property owners/managers and tenants.

One in every 25 EV charging spaces, but not less than one space, shall be a wider location than the “standard” EV charging space capable of being used by all users. For this EV charging space, an adjacent 5-foot aisle was required, making the total EV charging space width, including the aisle, 14 feet. This universal EV charging space, including the aisle, has a slope of not greater than 2.083 percent, which is capable of being used by all users. This EV charging space would provide persons with or without disabilities the same opportunity to use the EV charger.

2016 *CALGreen* (effective January 1, 2017)

The 2013 *CALGreen* was evaluated for updates during the 2015 Triennial Code Adoption Cycle. HCD took into consideration the existing mandatory and voluntary measures, stakeholder input, changes in technology, implementation of sustainable goals in California, changes in statutory requirements, and the emergency standards, adopted by BSC as part of the 2013 *CALGreen*. As such, the scope of *CALGreen* remained the same, and only a few significant regulatory changes were adopted.

2016 *CALGreen* Intervening Code Adoption Cycle

The 2016 Intervening Code Adoption Cycle resulted in changes to the 2016 *CALGreen* effective July 1, 2018. These changes included new requirements for EV infrastructure for hotels and motels. The flow rate for showerheads was reduced from 2.0 to 1.8 gallons per minute at 80 psi. Requirements for recycled water systems were also introduced.

CALGreen is not an isolated code and must be used in conjunction with other parts of Title 24 to achieve code compliance and ensure minimum standards for public health and safety. Awareness of energy and performance standards in Part 6, the *California Energy Code*, is also essential. Additionally, changes resulting from recent legislation, federal or state agency regulations, local building code amendments or court rulings must also be recognized and implemented. For these reasons, it is important that the current versions of the building standards code and any local amendments be referenced for application to construction projects.

See *A Guide to California Housing Construction Codes* for further details on California statutes and regulations.

The balance of this guide will provide discussions regarding administration of the code, definitions, provisions contained in *CALGreen* and information regarding referenced organizations and standards. This guide will also provide a detailed discussion of mandatory and voluntary measures for residential structures, installer and special inspector qualifications, and access to associated forms and worksheets.

Note: *CALGreen* also addresses green building standards for nonresidential structures. Those provisions are outside the scope of HCD's authority and application and are not discussed in this guide. BSC has authority for nonresidential structures and has developed a guide for the nonresidential portions of *CALGreen*.

2019 *CALGreen* (effective January 1, 2020)

The 2016 *CALGreen* was evaluated for updates during the 2018 Triennial Code Adoption Cycle. HCD took into consideration the existing mandatory and voluntary measures, stakeholder input, changes in technology, implementation of sustainable goals in California, and changes in statutory and regulatory requirements. The scope of the 2019 *CALGreen* remained the same. The most significant changes are to the EV charging infrastructure requirements. These will be discussed in detail later in this guide.